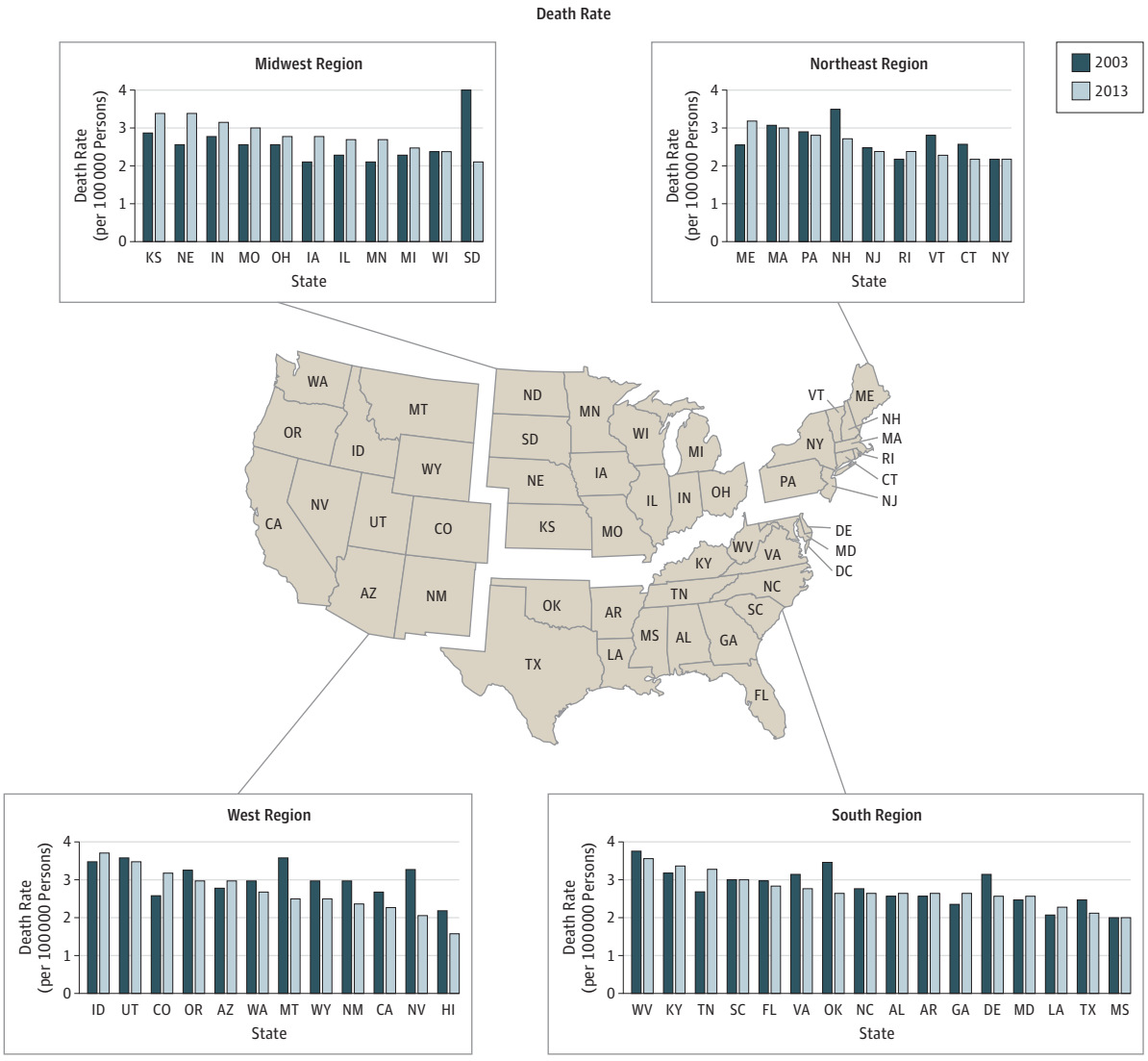
Letters

RESEARCH LETTER

Comparison of Regional and State Differences in Melanoma Rates in the United States: 2003 vs 2013

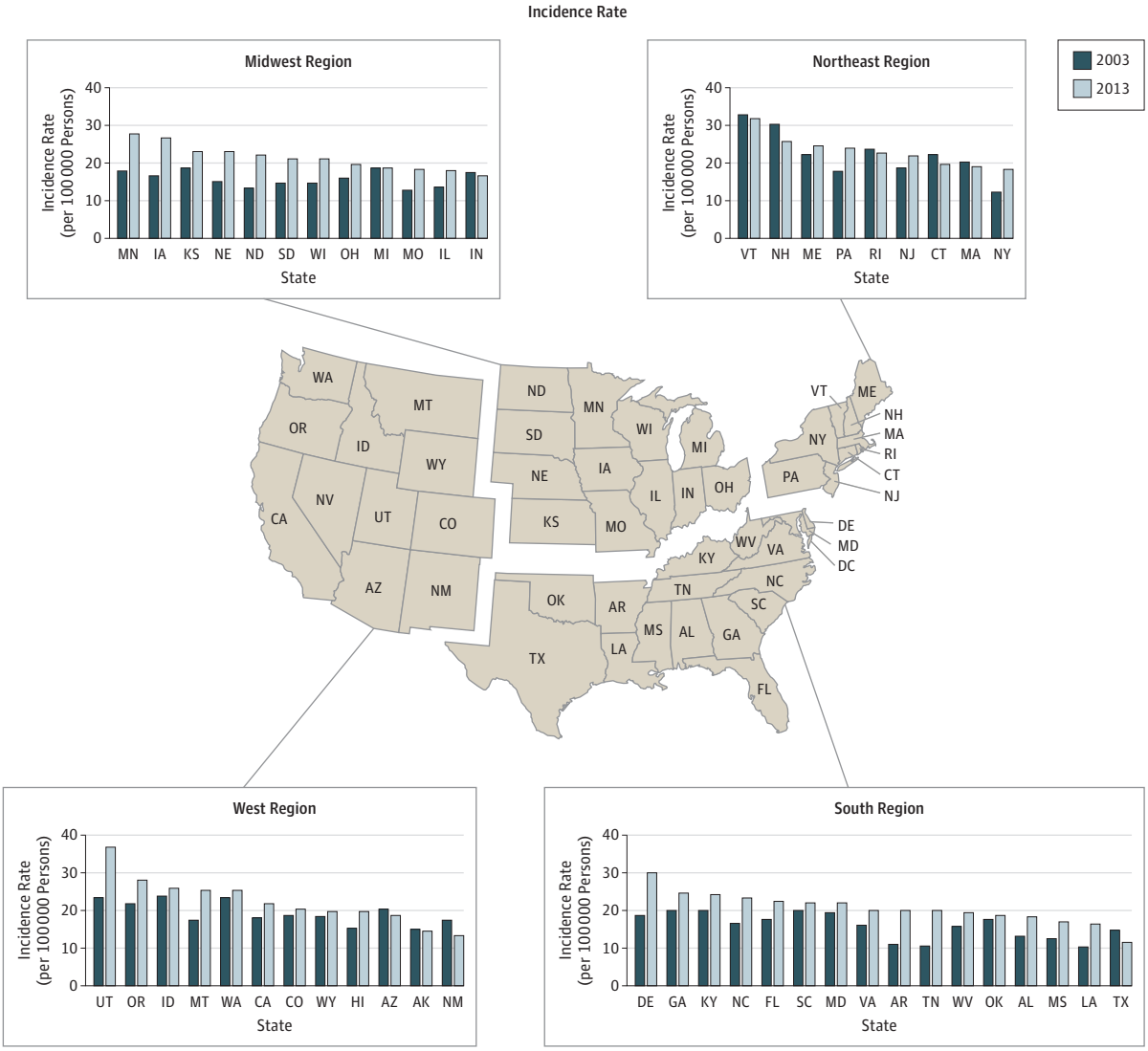
Skin cancer remains the most common cancer in the United States despite ongoing efforts to address this major public health problem.[1] The mortality rate of melanoma, with more than 9000 deaths occurring annually, continues to increase faster than the rate associated with any other preventable cancer.[1-3] Melanoma death and incidence rates vary among states, in part because of the differences in regional demographics.[4] To further characterize the effect of melanoma in the United States, we compared 2003 trends with 2013 trends in the death and incidence rates in each state and by geographic region.

Figure 1. Differences in Melanoma Death Rates by State



States in each US geographic region are ordered from highest (left) to lowest (right) death rate in 2013. Regional trends in death rates can be appreciated for the 4 regions. This regional map was adopted from Healthcare Cost and Utilization Project. Design of the HCUP KIDS' Inpatient Database (KID), 2003. The most recent version is found at https://www.hcup-us.ahrq.gov/db/nation/kid/reports/KID_design_rpt_2003.jsp. Data for the death rates of melanoma in Alaska in 2003 and 2013 as well as in North Dakota in 2003 were unavailable. All calculations were based on death rates for the 48 states that reported data for 2003 and 2013. Alaska and North Dakota were excluded from specific analyses and percentage calculations for the western and midwestern regions, respectively.

Figure 2. Differences in Melanoma Incidence Rates by State



Regional trends in incidence rates can be appreciated for the 4 regions. This regional map was adopted from Healthcare Cost and Utilization Project. Design of the HCUP KIDS' Inpatient Database (KID), 2003. The most recent version is found at https://www.hcup-us.ahrq.gov/db/nation/kid/reports/KID_design_rpt_2003.jsp. Data for the incidence rates of melanoma in Nevada in 2003 and 2013 were unavailable. All calculations were based on the incidence rates for the 49 states that reported data for 2003 and 2013. Nevada was excluded from specific analyses and percentage calculations for the western region.

Methods | From July 4, 2016, to July 15, 2016, we investigated data from the Centers for Disease Control and Prevention's United States Cancer Statistics database titled *Cancer Types Grouped by State and Region*. Because the database is publicly available, institutional review board approval was not necessary. Melanoma death and incidence rates per state during 2003 and 2013 were recorded. Rates were per 100 000 persons and were age-adjusted to the 2000 standard population of the US Census Bureau's population projections series P25-1130. From July 18, 2016, to July 29, 2016, we analyzed the rates for each state and by geographic region (ie, Northeast, Midwest, South, and West).

Results | Of the 48 states with reported melanoma death rates for both the 2003 and 2013 periods, 23 states (48%) experienced a decrease, 4 states (8%) experienced no change, and 21 states (44%) experienced an increase in death rates (**Figure 1** and **Figure 2**). Death rate data on Alaska for 2003 and 2013 and on North Dakota for 2003 were unavailable. Regionally, 6 (67%) of 9 northeastern states, 1 (9%) of 11 midwestern states, 7 (44%) of 16 southern states, and 9 (75%) of 12 western states experienced a decrease in death rates. No changes in the death rates were reported in 1 (11%) of 9 northeastern states, 0 of 11 midwestern states, 2 (13%) of 16 southern states, and 0 of 12 western states. An increase in the death rates occurred in 2 (22%) of 9 northeastern states, 10 (91%) of 11 midwestern states, 7 (44%) of 16 southern states, and 3 (25%) of 12 western states. The Figures 1 and 2 depicts the 2003 and 2013 death and incidence rates for each state by geographic region.

Of the 49 states with reported melanoma incidence rates, 11 (22%) experienced a decrease, and 38 (78%) experienced an increase in melanoma incidence (Figures 1 and 2). Incidence rate data on Nevada for 2003 and 2013 were unavailable. Regionally, a decrease in incidence rates occurred in 5 (56%) of 9 northeastern states, 2 (17%) of 12 midwestern states, 1 (6%) of 16 southern states, and 3 (25%) of 12 western states. An increase in the incidence rates was experienced in 4 (44%) of 9 northeastern states, 10 (83%) of 12 midwestern states, 15 (94%) of 16 southern states, and 9 (75%) of 12 western states.

Discussion | Several US geographic regions may require special focus. Eight (73%) of 11 midwestern states (for which we had information) experienced a rise in both death and incidence rates between 2003 and 2013, perhaps indicating a greater number of melanoma cases resulting in a greater number of deaths. Although a rise in incidence rates occurred almost homogeneously in 15 (94%) of 16 southern states, changes in death rates varied within the region. Seven (44%) states experienced an increase in death rates, while 7 (44%) others saw a decrease. Seven (64%) of 12 western states saw a reduction in death rates and a rise in incidence rates. Promoting greater awareness of skin cancer through public health programs has been associated with increased documentation and incidence rates.[5] Lower death rates may further indicate that better treatment may be prolonging the life of patients with melanoma. Further research into the prevalence of melanoma in these four geographic regions is needed.

The Northeast, specifically New England, is the only US geographic region in which most states experienced a reduction in both death and incidence rates. Strong skin cancer prevention programs likely played a role in this region's success. For example, the Melanoma Foundation of New England, a nonprofit organization founded in 1999, became more active over the period we assessed. Recently, the foundation launched the Practice Safe Skin initiative, which funded sunscreen dispensers in public and recreational areas throughout Boston and expanded to include other New England cities.[6] Such programs may enhance public awareness about skin cancer and may suppress the continual rise in melanoma.

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Study concept and design: All authors.
Acquisition, analysis, or interpretation of data: All authors.
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Statistical analysis: Mounessa, Caravaglio.
Administrative, technical, or material support: Mounessa.
Study supervision: Dellavalle.

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